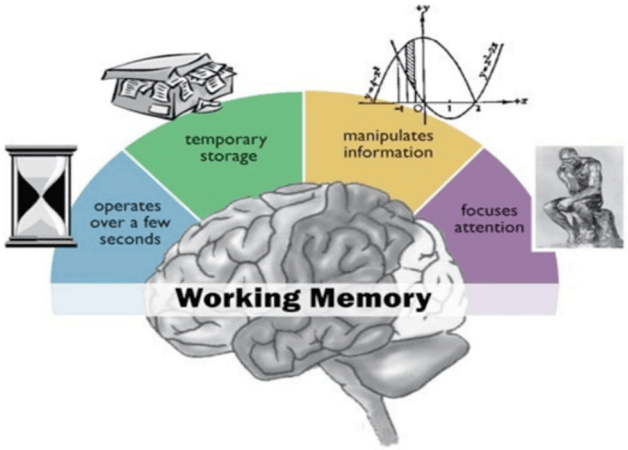

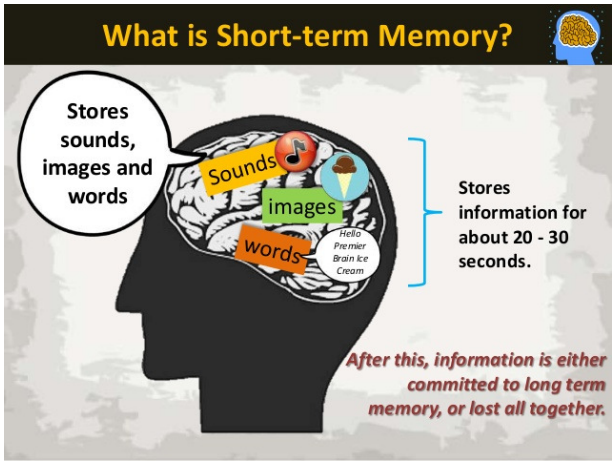

What is Working Memory?

- Working memory helps children hold on to information long enough to use it.
- Working memory plays an important role in concentration and in following instructions.
- Weak working memory skills can affect learning in many different subject areas including reading and Maths

Have you ever gone to the store without a list, thinking you'll remember everything you need…but discovered when you got home that you forgot several items? If so, you've experienced the limitations of working memory. Working memory is the mental sticky note we use to keep track of information until we need to use it.

Working memory is key to learning. Here are five ways children use working memory to learn.

1. Working Memory and Accessing Information

There are two types of working memory: auditory memory and visual-spatial memory. You can think of these skills in terms of making a video. Auditory memory records what you're hearing while visual-spatial memory captures what you're seeing. But that's where working memory's similarity with making a video ends.

When you make a video, visual and auditory information is stored for safekeeping and can be played back when you need to access it. You don't necessarily need to pay attention to details when you're filming. Working memory, on the other hand, isn't just stored for later use. It has to be accessed and "played back" immediately—even as new information is arriving and needing to be incorporated.

Imagine a teacher reads a word problem in the Maths class. Children need to be able to keep all the numbers in their head, figure out what operation to use and create a written Maths problem at the same time.

Children with weak working memory skills have difficulty grabbing and holding on to that incoming information. This means they have less material to work with when they're performing a task.

In the Maths class, they may know how to do different kinds of calculations. However, they run into trouble with word problems. It's difficult to listen for clue words that indicate which operation to use, while at the same time remembering the numbers that need to be plugged into the equation.

2. Working Memory and Remembering Instructions

Children rely on both incoming information and information stored in working memory to do an activity. If they have weak working memory skills, it's hard to juggle both. This can make it challenging to follow multi-step directions. Children with weak working memory skills have trouble keeping in mind what comes next while they're doing what comes now. For example, your child may not be able to mentally "go back" and recall what sentence the teacher wanted written down while also trying to remember how to spell out the words in that sentence.

3. Working Memory and Paying Attention

The part of the brain responsible for working memory is also responsible for maintaining focus and concentration. Here, working memory skills help children remember what they need to be paying attention to. Take, for example, doing a long division problem. Your child needs working memory not only to come up with the answer, but also to concentrate on all of the steps involved in getting there.

Children with weak working memory skills have trouble staying on task to get to the end result. You could think of it like the learning equivalent of walking into a room and forgetting what you came in to get.

4. Working Memory and Learning to Read

Working memory is responsible for many of the skills children use to learn to read. Auditory working memory helps children hold on to the sounds letters make long enough to sound out new words. Visual working memory helps children remember

what those words look like, so they can recognize them throughout the rest of a sentence.

When working effectively, these skills keep children from having to sound out every word they see. This helps them read with less hesitation and become fluent readers. Learning to read isn't as smooth a process for children with weak working memory skills.

5. Working Memory and Learning Maths

Being able to solve Maths problems depends on a number of skills that build on one another like building blocks. The block at the bottom - the most important one in the stack - is the ability to recognize and reproduce patterns. It's the foundation for the next block: seeing patterns in numbers in order to solve and remember basic Maths facts.

From there, children build up to storing information about a word problem in their head; they then use that information to create a number sentence to solve the problem. This eventually leads to the ability to remember mathematical formulas.

What keeps the blocks from toppling over is the ability to remember, sequence and visualize information - all of which can be difficult for a child with weak working memory skills.

Working Memory Boosters

1. Work on visualization skills.

Encourage your child to create a picture in his mind of what he's just read or heard. For example, if you've told him to set the table for five people, ask him to come up with a mental picture of what the table should look like. Then have him draw that picture. As he gets better at visualizing, he can describe the image to you instead of needing to draw it.

2. Have your child teach you.

Being able to explain how to do something involves making sense of information and mentally filing it. If your child is learning a skill, like how to dribble a basketball, ask him to teach it to you. Teachers do something similar by pairing up students in class. This lets them start working with the information right away rather than waiting to be called on.

3. Suggest games that use visual memory.

There are lots of matching games that can help your child work on visual memory. You can also do things like give your child a magazine page and ask him to circle all instances of the word *the* or the letter *a* in one minute. You can also turn license plates into a game. Take turns reciting the letters and numbers on a license plate and then saying them backwards, too.

4. Play cards.

Simple card games like Snap, Go Fish and Match the Words can improve working memory in two ways. Your child has to keep the rules of the game in mind, but he also has to remember what cards he has and which ones other people have played.

5. Encourage active reading.

There's a reason highlighters and sticky notes are so popular! Jotting down notes and underlining or highlighting text can help children keep the information in mind long enough to answer questions about it. Talking out loud and asking questions about the reading material can also help with this. Active reading strategies can help with forming long-term memories too.

6. Chunk information into smaller bites.

Ever wonder why phone numbers and social security numbers have hyphens in them? Because it's easier to remember a few small groups of numbers than it is to remember one long string of numbers. Keep this in mind when you need to give your child multi-step directions. Write them down or give them one at a time. You can also use graphic organisers to help break writing assignments into smaller pieces.

For Example: **A paragraph is like a hamburger, they both have several layers. Use this graphic organizer to help build a juicy paragraph.**

1. For the top layer, write the topic sentence that introduces the main idea.

2. Fill the middle layers with supporting details.
3. The bottom layer holds it all together with a conclusion sentence.

7. Make it multisensory.

Processing information in as many ways as possible can help with working memory and long-term memory. Write tasks down so your child can look at them. Say them out loud so your child can hear them. Toss a ball back and forth while you discuss the tasks your child needs to complete. Using ***multisensory strategies as in Cracking the ABC Code program*** can help your child keep information in mind long enough to use it.

How does multisensory instruction work?

Learning often relies on a child's sight to look at text and pictures and to read information. It also relies on a child's hearing to listen to what the teacher is saying.

Multisensory teaching isn't just limited to reading and listening. Instead, it tries to use all of the senses. Every lesson won't use all of a child's senses (taste, smell, touch, sight, hearing and movement. But in most multisensory lessons, students engage with the material in more than one way.

For example, let's say your child's class is studying apples. Your child might have the chance to visually examine, touch, smell and taste apples - instead of just reading and listening to his teacher speak about how they grow. Then he might hold a halved apple and count the number of seeds inside, one by one.

That's multisensory teaching. It conveys information through things like touch and movement - called tactile and kinaesthetic elements - as well as sight and hearing

8. Help make connections.

Help your child form associations that connect the different details he's trying to remember. Grab your child's interest with fun mnemonics like **Roy G. Biv.** (Thinking about this name can help children remember the order of the colours in the rainbow.) Finding ways to connect information helps with forming and retrieving long-term memory. It also helps with working memory, which is what we use to hold and compare new and old memories.

If your child continues to have significant difficulties with working memory, it might be a good idea to get an evaluation for attention issues. You may also want to explore tips from experts on topics like getting organized and managing attention.

- **Teaching your child ways to visualize thoughts can help improve his working memory.**

- **Card games and other fun activities can help build working memory.**

- **Finding ways to connect information can help your child with long-term memory as well as working memory.**